Semi-Annual Compliance Report
Associated Electric Cooperative, Inc.
New Madrid Power Plant, Unit 1

National Emission Standards for Hazardous Air Pollutants (NESHAP):
Coal and Oil-Fired Electric Utility Steam Generating Units
40 CFR Part 63 Subpart UUUUU – Mercury and Air Toxics Standards (MATS)

What is the purpose of this form?

The Mercury and Air Toxics Standards requires affected sources to submit a compliance report on a semiannual schedule as specified in §63.10031. This compliance report is the first to be submitted for the affected unit and includes the information as required by §63.10031(c).

SECTION I: SUMMARY REPORT (§63.10031(c)(1))

The following section contains information specified in §63.10(e)(3)(vi), paragraphs (A) through (M).

COMPANY NAME: Associated Electric Cooperative, Inc. – New Madrid Power Plant

ADDRESS: 41 St. Jude Road, Marston, MO 63866

REPORTING PERIOD: July 1, 2021, through December 31, 2021

MONITORED AIR POLLUTANTS: Mercury (Hg), Hydrochloric Acid (HCl), and Particulate Matter (PM)

DESCRIPTION OF PROCESS UNITS: New Madrid Unit 1 is a coal-fired unit, low rank virgin coal subcategory with the design capacity of 6,340 MMBtu/hr. The unit is equipped with activated carbon injection, overfire air, selective-catalytic reduction and electrostatic precipitator. Compliance for Part 63 Subpart UUUUU is being demonstrated by continuous monitoring of Hg via sorbent trap monitor, and quarterly performance testing for HCl and PM.

EMISSION/OPERATING PARAMETER LIMITS:

POLLUTANT	LIMIT
Mercury	1.2 lb/TBtu
Hydrochloric Acid	0.02 lb/MWh
Particulate Matter	0.3 lb/MWh

MONITORING EQUIPMENT: Apex Sorbent Trap Monitor, Model STM-12B

DATE OF LATEST CERTIFICATION/AUDIT: September 23, 2021

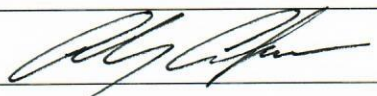
TOTAL OPERATING TIME: 2468 Hours

EMISSION DATA SUMMARY: Refer to the CEMS Performance Summary and Exceedance Events – Duration reports of this document. New Madrid unit 1 did experience an exceedance during the reporting period.

CMS PERFORMANCE SUMMARY: Refer to the CEMS Performance Summary and Downtime Events – Duration reports of this document. The total downtime for the sorbent trap monitoring system for the reporting period was 273 hours, resulting in 10.90%.

DESCRIPTION OF CHANGES IN CMS, PROCESS OR CONTROLS: Not applicable

RESPONSIBLE OFFICIAL:

NAME:	Andrew Cofas
TITLE:	Designated Representative, Senior Plant Manager
SIGNATURE:	
DATE:	1-28-2022

SECTION II: TOTAL FUEL USAGE (§63.10031(c)(2))

MONTH	SUB-BITUMINOUS COAL (TONS)	NUMBER 2 OIL (GALS)
July 2021	0	0
August 2021	72,648	37,700
September 2021	200,276	14,416
October 2021	176,294	17,772
November 2021	67,166	35,434
December 2021	196,656	24,844
Total	**713,040**	**130,166**

SECTION III: NEW FUELS (§63.10030(c)(3))

There were no new fuels combusted at New Madrid Unit 1 during the reporting period.

SECTION IV: BOILER PERFORMANCE TUNE-UPS (§63.10030(c)(4))

The most recent boiler performance tune-up was completed on November 15, 2020.

SECTION V: STARTUP DEFINITION (§63.10031(c)(5))

The requirements of §63.10031(c)(5) are not applicable to New Madrid Unit 1.

SECTION VI: EMERGENCY BYPASS INFORMATION (§63.10031(c)(6))

The requirements of §63.10031(c)(6) are not applicable to New Madrid Unit 1.

SECTION VII: SUMMARY OF ANNUAL PERFORMANCE TEST (§63.10031(c)(7))

HCL QUARTERLY PERFORMANCE TEST SUMMARY				
QUARTER	**TEST DATE**	**EMISSIONS (lb/MWh)**	**LOAD (MW)**	**LIMIT (lb/MWH)**
2016 3rd	September 2, 2016	0.009	586	0.02
2016 4th	November 15, 2016	0.008	630	0.02
2017 1st	March 2, 2017	0.009	623	0.02
2017 2nd	June 22, 2017	0.004	615	0.02
2017 3rd	August 17, 2017	0.004	620	0.02
2017 4th	December 13-14, 2017	0.007	623	0.02
2018 1st	February 20-22, 2018	0.007	626	0.02
2018 2nd	May 8, 2018	0.008	623	0.02
2018 3rd	July 18, 2018	0.007	593	0.02

2018 4th	October 10, 2019	0.009	619	0.02
2019 1st	January 8, 2019	0.010	623	0.02
2019 2nd	May 8, 2019	0.007	608	0.02
2019 3rd	August 22, 2019	0.001	601	0.02
2019 4th	December 3, 2019	0.008	606	0.02
2020 1st	March 10, 2020	0.007	632	0.02
2020 2nd	May 27-28, 2020	0.006	621	0.02
2020 3rd	September 9, 2020	0.0006	613	0.02
2020 4th	November 18, 2020	0.006	616	0.02
2021 1st	February 2, 2021	0.006	608	0.02
2021 2nd	April 22, 2021	0.006	612	0.02
2021 3rd	September 22, 2021	0.008	612	0.02
2021 4th	December 8, 2021	0.007	651	0.02

PM QUARTERLY PERFORMANCE TESTS SUMMARY				
QUARTER	**TEST DATE**	**EMISSIONS (lb/MWh)**	**LOAD (MW)**	**LIMIT (lb/MWH)**
2016 3rd	September 2, 2016	0.19	586	0.30
2016 4th	November 15, 2016	0.02	630	0.30
2017 1st	March 1, 2017	0.05	619	0.30
2017 2nd	June 20, 2017	0.08	602	0.30
2017 3rd	August 18, 2017	0.08	618	0.30
2017 4th	December 13, 2017	0.25	623	0.30
2018 1st	February 20-22, 2018	0.16	626	0.30
2018 2nd	May 8, 2018	0.05	624	0.30
2018 3rd	July 17, 2018	0.09	593	0.30
2018 4th	October 10, 2019	0.06	619	0.30
2019 1st	January 8, 2019	0.06	623	0.30
2019 2nd	May 8, 2019	0.06	609	0.30
2019 3rd	August 22, 2019	0.04	601	0.30
2019 4th	December 3, 2019	0.07	606	0.30
2020 1st	March 10, 2020	0.095	632	0.30
2020 2nd	May 27-28, 2020	0.136	621	0.30
2020 3rd	September 9, 2020	0.087	613	0.30
2020 4th	November 18, 2020	0.060	616	0.30
2021 1st	February 2, 2021	0.088	608	0.30
2021 2nd	April 22, 2021*	0.109*	612	0.30

*Missouri Department of Natural Resources was notified in a letter dated March 8, 2021, that with the completion of the second quarter MATS PM test, New Madrid Unit 1 qualified for PM LEE status. The next PM test will be conducted in the second quarter of 2025.

SECTION VIII: CERTIFICATION (§63.10031(c)(8))

HG SORBENT TRAP MONITOR CERTIFICATION			
TEST DATE	**LOAD (MW)**	**RELATIVE ACCURACY**	**ACCEPTANCE CRITERIA**
August 4, 2016	604	15.04%	RA < 20%
June 27, 2017	616	0.086 ug/m^3	< 0.5 ug/m^3
May 9, 2018	621	13.867%	RA < 20%
June 26, 2019	620	0.073 ug/m^3	< 0.5 ug/m^3
April 15, 2020	626	15.365%	RA < 20%
Sept 23, 2021	626	9.111%	RA < 20%

SECTION IX: DEVIATIONS (§63.10031(c)(9))

DATE/TIME OF MALFUNCTION/REPAIR/OOC: 08/12/2021 and 08/21/2021

NATURE/CAUSE OF MALFUNCTION/REPAIR/OOC: Both traps failed paired spike agreement.

CORRECTIVE ACTION/PREVENTATIVE MEASURES: Ran calibration samples to determine if the calibration drifted. All standards were in normal ranges.

NATURE OF REPAIRS/ADJUSTMENTS: Contacted manufacture to determine cause of failure.

DATE/TIME OF MALFUNCTION/REPAIR/OOC: 08/28/2021

NATURE/CAUSE OF MALFUNCTION/REPAIR/OOC: Failed spike recovery >125%.

CORRECTIVE ACTION/PREVENTATIVE MEASURES: Ran calibration samples to determine if the calibration drifted. All standards were in normal ranges.

NATURE OF REPAIRS/ADJUSTMENTS: Contacted manufacture to determine cause of failure.

DATE/TIME OF MALFUNCTION/REPAIR/OOC: 08/31/2021, 10/02/2021, and 10/26/2021

NATURE/CAUSE OF MALFUNCTION/REPAIR/OOC: System paused during run.

CORRECTIVE ACTION/PREVENTATIVE MEASURES: System taken out of paused state manually.

NATURE OF REPAIRS/ADJUSTMENTS: Performed sorbent trap audit on Apex system. Found a dry gas meter failed both meters were replaced.

DATE/TIME OF MALFUNCTION/REPAIR/OOC: 08/25/2021, 08/28/2021-09/07/2021, and 09/10/2021-09/20/2021

NATURE/CAUSE OF MALFUNCTION/REPAIR/OOC: The unit underwent multiple startup and shutdown events coming out of outage where boiler, generator and turbine tuning were required. Mercury emissions post outage were elevated during this time. Our control system was inadequate at controlling mercury emissions.

CORRECTIVE ACTION/PREVENTATIVE MEASURES: On 8/20/21 the Activated Carbon Injection (ACI) system was set to the feed rate of 130 lbs./hr. 8/23 the feed rate was increased to 200 lbs./hr. 8/24 Tinuum MProve (B additive) feed rate increased from 2 ppm to 4 ppm. Unit was taken offline 8/25 due to mercury concerns. While the unit was offline the feed auger on the ACI system was upgraded to allow for a higher feed rate. The Unit came back online 8/28 but elevated levels of mercury continued, and the Unit was taken offline a second time on 9/07. On 9/09 the Unit was put back in service while running the SCR with no ammonia, using the catalyst to help oxidize the mercury. The MProve feed rate was increased to 16 ppm, and the ACI feed rate was increased to 370 lbs./hr. On 9/17 the mercury concentration stabilized and began to drop.

NATURE OF REPAIRS/ADJUSTMENTS: Installed larger auger on ACI system to increase feed rate. Investigated and purchased a new carbon to inject in the ACI system with larger mercury capture potential. Purchased and ran daily speciated sorbent traps. Installed mercury CEMS system to monitor the hourly values and adjust the carbon feed rate as necessary.

CEMS Performance Summary

Company: New Madrid Power Plant
Address: P.O. Box 156
New Madrid, MO 63869

Source: UNIT1
Pollutant: HG#/T30
Interval: 30 Days
Limit: 1.20

Report Period: 07/01/2021 00:00 Through 12/31/2021 23:59
Total Source Time in Report Period: 2504 Hours
Time Online Criteria: 1 Minute(s)

Manufacturer: Apex
Model Number: STM-12B
Cert. Date: 8/4/2016

Causes of CEMS Excess Emissions	Duration of Excess Emissions (Hours)	Percent of Operating Time
Air Pollution Control Equipment Failure	0.00	0.00
Fuel Problems (02)	0.00	0.00
Process Problems (03)	0.00	0.00
Unknown Cause [Excess Emissions] (04)	0.00	0.00
Startup (05)	0.00	0.00
Soot Blowing (06)	0.00	0.00
Other Known Causes [Excess Emissions] (0	552	22.04
Shutdown (08)	0.00	0.00
Total duration of excess emission	**552**	**22.04**

Causes of CEMS Downtime	Duration of Downtime (Hours)	Percent of Operating Time
Monitor Equipment Malfunction (01)	0.00	0.00
Non-monitor Equipment Malfunction (02)	0.00	0.00
Quality Assurance (03)	273.00	10.90
Other Known Causes [Monitor Malfunction]	0.00	0.00
Unknown Cause [Monitor Malfunction] (05)	0.00	0.00
Total duration of downtime	**273.00**	**10.90**

Downtime Events - Duration

Plant: NEW MADRID POWER PLANT-AECI
Report Period: 07/01/2021 00:00 Through 12/31/2021 23:59
Time Online Criteria: 1 minute(s)

Source: UNIT1
Parameter: HG#/T30
Interval: 001H

Incident ID	Start Date/Time	End Date/Time	Duration (dd:hh:mm)	Reason Code - Description
1	08/12/2021 11:00	08/12/2021 14:59	0d - 4h - 0m	11 - Quality Assurance (03)
2	08/21/2021 23:00	08/25/2021 07:59	3d - 9h - 0m	11 - Quality Assurance (03)
3	08/28/2021 14:00	08/30/2021 07:59	1d - 18h - 0m	11 - Quality Assurance (03)
4	08/31/2021 08:00	09/02/2021 08:59	2d - 1h - 0m	11 - Quality Assurance (03)
5	09/14/2021 08:00	09/14/2021 08:59	0d - 1h - 0m	11 - Quality Assurance (03)
6	09/17/2021 08:00	09/17/2021 09:59	0d - 2h - 0m	11 - Quality Assurance (03)
7	09/23/2021 14:00	09/23/2021 14:59	0d - 1h - 0m	11 - Quality Assurance (03)
8	10/02/2021 10:00	10/02/2021 10:59	0d - 1h - 0m	11 - Quality Assurance (03)
9	10/02/2021 13:00	10/04/2021 06:59	1d - 18h - 0m	11 - Quality Assurance (03)
10	10/26/2021 07:00	10/28/2021 07:59	2d - 1h - 0m	11 - Quality Assurance (03)
11	12/02/2021 10:00	12/02/2021 10:59	0d - 1h - 0m	11 - Quality Assurance (03)
		Number of Events:	11	
		Total Duration:	11d - 9h - 0m	

* Indicates duration incident could have additional data prior to the start date or following the end date.

Exceedance Events - Duration

Plant: NEW MADRID POWER PLANT-AECI
Report Period: 07/01/2021 00:00 Through 12/31/2021 23:59
Time Online Criteria: 1 minute(s)

Source: UNIT1 **Standard Limit:**

Parameter: HG#/T30

Interval: 030D

Incident ID	Start Date/Time	End Date/Time	Duration (dd:hh:mm)	Max Value	Reason Code - Description
1	08/25/2021 00:00:00	08/25/2021 23:59:59	1d - 0h - 0m	1.214	07 - Other Known Causes [Excess Emissions] (07)
2	08/28/2021 00:00:00	09/07/2021 23:59:59	11d - 0h - 0m	1.774	07 - Other Known Causes [Excess Emissions] (07)
3	09/10/2021 00:00:00	09/20/2021 23:59:59	11d - 0h - 0m	1.972	07 - Other Known Causes [Excess Emissions] (07)
		Number of Events:	3		
		Total Duration:	23d - 0h - 0m		

* Indicates duration incident could have additional data prior to the start date or following the end date.